In the Claims

1. (Currently Amended) A method of slice selective magnetization preparation for moving table MRI, the method comprising the steps of:

defining a fixed imaging slice within an optimal imaging volume of an MR system;

applying a preparation RF pulse to prepare a region of interest outside the fixed imaging slice but within the optimal imaging volume;

translating the prepared region of interest to the fixed imaging slice; and;

applying an imaging RF pulse to the fixed imaging slice to acquire MR data of the prepared region of interest.

2. (Original) The method of claim 1 wherein the region of interest has a same width as that of the fixed imaging slice.

3. (Original) The method of claim 1 further comprising the step of applying a preparation RF pulse to a region of interest different from the fixed imaging slice and acquiring MR data from the region of interest present at the fixed imaging slice.

4. (Original) The method of claim 1 further comprising the step of offsetting application of the preparation RF pulse as a function of translation direction.

5. (Original) The method of claim 4 further comprising the step of offsetting application of the preparation RF pulse opposite to translation direction.

6. (Original) The method of claim 1 further comprising the step of determining an offset value from a product of translation distance of a spin at a user-defined TI, amplitude of a slice selective gradient applied to the imaging volume, and a gyromagnetic ratio.

7. (Original) The method of claim 1 further comprising the step of continuously translating the subject through the imaging volume.

8. (Original) The method of claim 1 wherein the preparation RF pulse includes an inversion recovery pulse.

9. (Original) The method of claim 1 further comprising the step of applying the preparation RF pulse such that a time between application of preparation RF pulses is substantially equivalent to an amount of time needed to translate the subject one imaging slice thickness.

10. (Original) An MRI apparatus comprising:

a magnetic resonance imaging (MRI) system having a plurality of gradient coils positioned about a bore of a magnet to spatially encode spins and an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MR images; and

a computer programmed to:

receive a user input identifying a preparation interval, TI, for a pulse sequence that acquires data of a subject being continuously translated through an imaging volume;

from the preparation interval, determine a frequency offset value, f_{off}, to be applied to a preparation RF pulse of the pulse sequence;

modify application of the preparation RF pulse to account for translation of the subject through the imaging volume; and

generate a modified pulse sequence such that the preparation RF pulse has been modified by the offset value.

11. (Original) The MRI apparatus of claim 10 wherein the offset value is defined by:

$$f_{off} = \gamma * A_{ss} * v * TI,$$

where γ is a gyromagnetic ratio, A_{ss} is an amplitude of a slice selective gradient applied during the preparation RF pulse, v is a velocity of the subject being translated, and TI is a preparation interval.

12. (Original) The MRI apparatus of claim 10 wherein the computer is further programmed to determine a direction of subject translation and apply the offset value to the preparation RF pulse opposite to the direction of subject translation.

13. (Original) The MRI apparatus of claim 10 wherein the modified preparation RF pulse includes an inversion recovery pulse.

14. (Original) The MRI apparatus of claim 10 wherein the computer is further programmed to repeat application of each preparation RF pulse at a time substantially equivalent to that needed to translate the subject one slice thickness.

15. (Original) The MRI apparatus of claim 10 wherein the modified pulse sequence includes a gradient echo sequence.

16. (Original) The MRI apparatus of claim 10 wherein the computer is further programmed to change at least one of the preparation interval and the preparation sequence in a prescribed manner as the subject is translated.

17. (Currently Amended) A computer readable storage medium having a computer program stored thereon to acquire MR data of a patient being translated through an imaging volume, the computer program having a set of instructions that when executed causes a computer to:

determine a distance spins of a magnetization prepared tissue of a patient will travel while the patient is translated through an imaging volume by a moving table during a prescribed preparation interval defined as the time between application of a saturation pulse and commencement of an imaging pulse sequence;

determine, from the distance, a preparation volume of interest; and

generate an imaging pulse sequence to acquire MR data from a patient being translated past a fixed imaging volume such that the preparation volume of interest is prepared before being presented in the fixed imaging volume.

18. (Original) The computer readable storage medium of claim 17 wherein the set of instructions further causes the computer to determine an amplitude of a slice selective gradient and multiply the amplitude and a gyromagnetic ratio to the distance to determine the frequency offset of the preparation pulse.

19. (Original) The computer readable storage medium of claim 17 wherein the computer is further programmed to identify the preparation volume of interest relative to the fixed imaging volume in a direction opposite of table translation.

20. (Original) The computer readable storage medium of claim 19 wherein the computer is further programmed to define the preparation volume of interest to have the same slice thickness as the fixed imaging volume.

21. (Original) The computer readable storage medium of claim 17 wherein each preparation RF pulse has a flip angle of 180°.

22. (Original) The computer readable storage medium of claim 17 wherein imaging volume includes one of a single slice and a slab of multiple slices.